

APPLICATION UNDER UNITED STATES PATENT LAWS

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Invention: METHOD AND APPARATUS FOR RECORDING AND REPRODUCING DIGITAL VIDEO DATA

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This is a:

- ☐ Provisional Application
- ☒ Regular Utility Application
- ☐ Continuing Application
 - ☐ The contents of the parent are incorporated by reference
- ☐ PCT National Phase Application
- ☐ Design Application
- ☐ Reissue Application
- ☐ Plant Application
- ☐ Substitute Specification
 - Sub. Spec Filed _____
 - in App. No. _____ / _____
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 - Sub. Spec. filed _____
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SPECIFICATION

TITLE OF THE INVENTION
METHOD AND APPARATUS FOR RECORDING AND REPRODUCING
DIGITAL VIDEO DATA

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is based upon and claims the
benefit of priority from the prior Japanese Patent
Application No. 2002-347507, filed November 29, 2002,
the entire contents of which are incorporated herein by
reference.

10 BACKGROUND OF THE INVENTION

1. Field of the Invention

 This invention relates generally to an apparatus
for recording and reproducing broadcast TV programs.
More particularly, it relates to a technique of
15 reserving the recording broadcast TV programs.

2. Description of the Related Art

 In recent years, apparatus have been developed,
which record and reproduce, for example, TV programs
broadcast on ground waves or from digital TV broadcast
20 satellites, on DVDs (Digital Video Disks) or in HDDs
(Hard Disk Drives). Of these apparatus, those which
record and reproduce TV programs on DVDs are called
"DVD video recorders." And those which record and
reproduce TV programs in HDDs are known as "HDD video
25 records."

 Most digital program-recording/reproducing
apparatus can reserve the recording of any desired

broadcast TV program, by virtue of so-called EPG
(Electronic Program Guide). (See Jpn. Pat. Appln.
KOKAI Publication No. 2002-247463, for example.) EPG
is the function of electronically selecting the channel
of a desired TV program and reserving the recording of
the TV program, in accordance with the EPG information
received from broadcast digital TV information.

Various digital recording/reproducing apparatus
have been recently developed. They can be connected to
the Internet to receive the EPG information from a
specific site (iEPG site) and reserve the recording of
broadcast TV programs. Most apparatus of this type are
connected to or combined with computers that have a Web
browser for retrieving data from sites existing on the
Internet.

A digital recording/reproducing apparatus of this
type can always acquire EPG information from not only
broadcast digital TV information, but also the
Internet. It can therefore mitigate the restriction
imposed on the reservation of TV program recording and
perform additional functions. Nonetheless, it needs
a dedicated application program in order to register
the EPG information obtained from the iEPG site, as
program-recording reservation data. Thus, the
dedicated application program must be set in the
digital recording/reproducing apparatus. In view of
this, the apparatus cannot be said to be friendly to

most users.

BRIEF SUMMARY OF THE INVENTION

In accordance with an aspect of the invention,
there is provided an apparatus for recording and
5 reproducing digital video data and acquiring program-
recording reservation data from a network such as the
Internet.

The apparatus comprises a communications unit, a
reservation-registering unit, and a data-acquiring
10 unit. The communications unit can be connected to
a network and transmits and receive data. The
reservation-registering unit registers recording
reservation data provided from the network. The data-
acquiring unit transmits a request for the recording
15 reservation data to an information-providing site
connected to the network, in response to a request
transmitted from an information terminal connected to
the network. It acquires the recording reservation
data provided from the information-providing site, and
20 transfers the recording reservation data to the
reservation-registering unit.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated
in and constitute a part of the specification,
25 illustrate embodiments of the invention, and together
with the general description given above and the
detailed description of the embodiments given below,

serve to explain the principles of the invention.

FIG. 1 is a block diagram showing the major components of a program-recording recording/reproducing apparatus according an embodiment of this invention;

5 FIGS. 2 and 3 are diagrams explaining a method of reserving the recording of a desired broadcast TV program, according to the invention; and

FIG. 4 is a flowchart explaining the sequence of steps of reserving the recording of a desired TV,
10 according to this invention.

DETAILED DESCRIPTION OF THE INVENTION

An embodiment of the present invention will be described, with reference to the accompanying drawings.
(Recording/Reproducing Apparatus)

15 FIG. 1 is a block diagram illustrating a recording recording/reproducing apparatus 10 that is an embodiment of the present invention.

The apparatus 10 comprises a disk drive unit 101, a TV tuner 103, an AV input unit 104, and an encoder
20 105. The disk drive unit 101 can record broadcast TV programs. The TV tuner 103 is configured to receive broadcast TV programs. The AV input unit 104 can input AV (Audio-Video) signals, which are digital signals.

The disk drive unit 101 is a recording unit that
25 records broadcast TV programs. The unit 101 includes a disk drive 101A and a buffer memory 101B. The buffer memory 101B temporarily stores the video data

(containing audio data) encoded by the encoder 105.

The disk drive 101A can write and read data on and from a disk-shaped recording medium 102. The medium 102 is, for example, a DVD-RAM, a DVD-R or a hard disk. The TV
5 tuner 103 selects the channel of any desired TV program (video signals). The TV tuner 103 includes an A/D converter. This converter converts the video signals of the channel selected (i.e., the desired TV program) to digital video data. The encoder 105 receives
10 the digital video data and compresses the same in accordance with a prescribed data-compressing standard.

The apparatus 10 further comprises a decoder 106, AV output unit 107, user input unit 108, a timer microcomputer (timer MPU) 109, microprocessor (MPU)
15 110, memory 111, display unit 112 and communications control unit 113. The decoder 106 can reproduce the TV program recorded.

The decoder 106 receives the program data (compressed data) from the disk drive unit 101 and
20 decodes it to digital video data. The digital video data is sent to the AV output unit 107. The AV output unit 107 converts the digital video data to analog signals. The analog signals are output to, for example, a monitor.

25 The user input unit 108 is, for example, a keyboard. The user may operate the unit 108 to input various modes, thus operating the apparatus 10 in these

modes. The timer MPU 109 receives and registers program-recording reservation data (EPG information). It reserves the recording of desired TV programs in accordance with the program-recording reservation data.

5 The MPU 110 is the main control unit in the apparatus 10. The MPU 110 can acquire and manage the program-recording reservation data as will be described later. The memory 111 is shared by the timers MPU 109 and the MPU 110. The memory 111 is used mainly to store the
10 program-recording reservation data (i.e., EPG information).

The display unit 112 has, for example, a liquid-crystal display panel. It displays data to be used to reserve the recording of any desired TV program, under
15 the control of the CPU 110. The communications control unit 113 is connected to a network 30. The unit 113 has a network device that is designed to communicate (or exchange various data) with any devices on the network 30. The network 30 may be a LAN, the Internet
20 or any other network. The present embodiment is connected to the Internet.

An information terminal (PC) 20 and an iEPG site 40 are connected to the Internet 30. The PC 20 is, for example, a personal digital assistant (PAD) or a
25 mobile telephone. The iEPG site is an information-providing site that gives EPG information (i.e., program-recording reservation data) to the apparatus 10

via the Internet 30.

(Reservation of the Recording of a Desired Program)

5 The apparatus 100 reserves the recording of a
desired program, as will be described with reference to
FIGS. 1, 2 and 3 and the flowchart of FIG. 4. First,
the principle on which the recording of the desired
program is reserved will be outlined with reference to
FIG. 2.

10 As FIG. 2 shows, the communications control unit
113 can exchange various data with the PC 20 and iEPG
site 40 via the Internet 30. The data is necessary for
reserving the recording of the desired program. Assume
that the user of the apparatus 10 operates the PC 20 at
a place far from the apparatus 10, to reserve the
15 recording of a TV program he or she want to enjoy.

 The user operates the PC 20, inputting a request
for program-recording reservation data. The Web
browser in the PC 20 transmits the request via the
Internet 30 to the apparatus 10. In response to the
20 request, the apparatus 10 acquires the program-
recording reservation data (i.e., EPG information) from
the iEPG site. In the apparatus 10, the reservation
data is supplied to the program-recording reservation
module (application software). More precisely, the
25 timer MPU 109 activates the module, storing (or
registering) the program-recording reservation data in
the memory 111. Then, the apparatus 10 transmits the

data indicating that the recording of the TV program has been reserved, to the PC via the Internet 30. The data indicates that program-recording reservation data has been downloaded into the apparatus 10.

5 As FIG. 3 shows, the apparatus 10 transfers the program-recording reservation data (i.e., EPG information) to the PC 20. This data has been acquired from the iEPG site. The apparatus 10 then transfers the reservation data to the program-recording
10 reservation module, in response to a request for the registering of the reservation data, which is transmitted from the PC 20.

 The sequence of reserving the recording of a TV program will be explained, with reference to the
15 flowchart of FIG. 4.

 The communications control unit 113 receives a request for the reservation data (i.e., EPG information) from the PC 20 via the Internet 30, by virtue of the browser function of the PC 20 (Step S1).
20 This request is supplied to the MPU 110. When the MPU 110 receives the request, it accesses the iEPG site 40 connected to the Internet 30 and requests for the program-recording reservation data (Step S2).

 Upon receipt of the request from the MPU 110, the
25 iEPG 40 transmits the reservation data to the apparatus 10. The MPU 110 receives the reservation data from the iEPG site 40 (Step S3). The MPU 110 transfers the data

to the timer MPU 109 (Step S4). The timer MPU 109 stores the reservation data into the memory 111. The data is thereby registered (Step S5). The MPU 110 generates data indicating that the recording of the program has been reserved and transmits this data to the PC 20 (Step S6). Then, it is determined whether the program-recording reservation data has been registered or not (Step S7). If YES in Step S7, the process of reserving the recording of a TV program is terminated.

The user can thus cause the apparatus 10 to reserve the recording of any TV program he or she wants to enjoy. He or she only need to operate the PC 20 at a place far from the apparatus 10, sending commands to the apparatus 10 via the Internet 30. The user may operate PC 20 to access the iEPG site 40 via the Internet 30, thus confirming the reservation data that should be registered in the apparatus 10.

If NO in Step S7, that is if the program-recording reservation data has not been registered, the apparatus 10 transmits the reservation data to the PC 20 via the Internet 30 (Step S8). The PC 20 displays the reservation data it has just received. The user can therefore confirm the reservation data. If necessary, the user may operate the PC 20 to change the reservation data or add new data items to the reservation data. New program-recording reservation

data is thereby generated.

The PC 20 transmits the new reservation data to the apparatus 10 via the Internet 30. The apparatus 10 receives the new reservation data (Step S9). In the
5 apparatus 10, the new reservation data is transferred to the timer MPU 109 (Step S4) and stored into the memory 111 (Step S5). The program-recording reservation data is thereby renewed or updated. The items of reservation data which can be changed include
10 recording date, recording-start time, recording-end time, channel number, program title, and summary of the program, and the like. The data items that can be added to the reservation data are image quality, sound quality, genre of the program (movie, music, variety
15 show, etc.), and the like.

The apparatus 10 described above can acquire the program-recording reservation data from any iEPG site connected to the Internet 30. It can register the reservation data, though the PC 20 stores no data-
20 registering application program. That is, the apparatus 10 functions as an HTTP client connected to the Internet and can acquire the reservation data from, for example, an iEPG site 40 (i.e., information-providing site). The apparatus 10 can register the
25 reservation data. The user only needs to operate the information terminal 20 (e.g., portable PC, mobile telephone, or the like.) connected to the Internet, in

order to reserve the recording of any TV program
desired, even at a place very far from the apparatus
10. The user can easily reserve the recording of TV
programs and can set various modes in which the
5 apparatus 10 should record and reproduce the programs.

As has been described, the present invention can
provide a program-recording/reproducing apparatus that
can easily acquire program-recording reservation data
from a network such as the Internet and can register
10 the reservation data, and provide a method of reserving
the recording of TV programs. The apparatus can be
connected to a network such as the Internet. Once so
connected, it can acquire reservation data from an
information-providing site (e.g., iEPG site) that is
15 connected to the Internet. It can then register the
reservation data, in response to a request made by an
external unit such as an information terminal.

No data-registering application program is
installed in the information terminal. The program-
20 recording/reproducing apparatus can, nonetheless,
function as an HTTP client connected to the Internet.
It can acquire the reservation data from an
information-providing site (e.g., iEPG site) and
register the reservation data. The user only needs to
25 operate his or her information terminal (e.g., portable
PC, mobile telephone, or the like) connected to the
Internet, to reserve the recording of any TV program

desired, even at a place very far from the apparatus.
The user can therefore easily reserve the recording of
the TV programs and set various modes in which the
apparatus should record and reproduce the programs.

5 Additional advantages and modifications will
readily occur to those skilled in the art. Therefore,
the invention in its broader aspects is not limited to
the specific details and representative embodiments
shown and described herein. Accordingly, various
10 modifications may be made without departing from the
spirit or scope of the general inventive concept as
defined by the appended claims and their equivalents.